

Effects of Environmental Factors on the Resumption of Photosynthesis in a Desiccated Cyanobacterial Mat

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The upper intertidal zone of the Laguna Ojo de Liebre near Guerrero Negro, BCS is covered with a bacterial mat dominated by the mat-forming cyanobacterium *Lyngbya* cf. *aestuarii*. The *Lyngbya* mat is wetted for a few days about every two weeks during spring tides with environmental conditions varying during these periods of hydration. PAM fluorometry, oxygen concentration measurements and carbon fixation assays were used to measure photosynthetic activity during the first few hours after rehydration under a variety of conditions. Photosynthetic activity could recover within an hour after rehydration, although the water salinity, the intensity of illumination and UV radiation affected the rate of recovery as well as the final photosynthetic yield. The highest recovery rates and photosynthetic yields occurred in mat rehydrated with salinities similar to that of the lagoon (25-50 ppt). The *Lyngbya* mat also took less time to recover with increasing light intensities under almost all salinities, but especially at lower salinities (10-25 ppt). However, these higher rates at the low salinities did not translate into higher photosynthetic yields. The results described above were most likely due to a combination of factors including greater photoinhibition at high and low salinities. UV radiation affected only mat rehydrated in 50 ppt water, lowering photosynthetic yields late in recovery (>120 min.). The UV effect was most likely due to the large numbers of hormogonia on the mat surface; these lacked sheaths and thus the UV screening pigment, scytonemin. High and low salinities inhibited hormogonial production.